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A Galois counting problem

We count monic cubic and quartic polynomials with prescribed Galois group. We obtain the order of magnitude for D_4 quartics, and show that if $d \in \{3, 4\}$ then irreducible non- S_d polynomials of degree d are less prevalent than reducible polynomials of degree d . The latter confirms the cubic and quartic cases of a 1936 conjecture of van der Waerden. This is joint work with Rainer Dietmann.